

Year 6 Science Assessment: The Power of Forces

Learning objective: To demonstrate understanding of how forces act on objects, including gravity, air resistance, water resistance, and mechanical mechanisms.

Read each question carefully. Use your scientific knowledge to explain your answers clearly. Max the monkey is watching to see how you solve these puzzles!

Nova the owl is observing the movement of objects in the forest. She watches a leaf drifting slowly to the ground, a marble rolling down a ramp, and a squirrel jumping from a branch. She knows that every movement is governed by the invisible push and pull of forces.

Word bank: Gravity · Friction · Air resistance · Surface area · Newton · Mechanism · Levers · Gears · Pulleys

1. 1. What is the name of the force that pulls all objects towards the centre of the Earth? (1 mark) (1 mark)

2. 2. Max rolls a toy car across three different surfaces: carpet, wood, and sandpaper. Explain why the car travels the furthest distance on the wooden floor. (2 marks) (2 marks)

3. 3. If you drop a flat piece of paper and a crumpled ball of paper at the same time, the ball hits the ground first. Use the concept of air resistance to explain why this happens. (3 marks) (3 marks)

4. 4. Kit the fox is building a pulley system to lift a heavy bucket of nuts. How does a pulley system make it easier for Kit to lift the load compared to lifting it directly by hand? (3 marks) (3 marks)

5. 5. Compare how gears and levers can be used to help humans perform tasks that require a large force. Give one example of a lever in everyday life. (4 marks) (4 marks)

6. 6. Design an experiment to test how the surface area of a parachute affects the speed at which it falls. In your answer, include your prediction, the variables you will keep the same (control variables), and how you will measure the results. (7 marks) (7 marks)

7. 7. If a small toy costs £2.50 to build, and you want to use a gear system to make it move faster, why might the cost increase to £4.75? Consider the materials needed for the mechanism. (5 marks) (5 marks)

Draw: Draw a diagram of a simple lever. Label the 'load', the 'effort', and the 'pivot' (fulcrum).



Extension challenge: Total: /25. Challenge: Research how streamlining a vehicle reduces water resistance. How does this help a ship save fuel?